

flexibility described above. For instance, referring to FIG. 18, the spacer 10 can include a plurality of rigid segments 81 connected together along a single axis using at least one spanning member 85 inserted through each segment 81 and fixed at the ends of the assembled construct and/or fixed to each segment 81 along the length L of the construct. The spanning member 85 could be made of a suitable elastomeric material, such as silicone, polyethylene, or ultra-high molecular weight polyethylene (UHMWPE), able to allow rotation and/or bending along the central axis 13 of the construct, while allowing transmission of axial and/or torsional load required for spacer 10 implantation. Alternatively, the spanning member 85 could be made of a material suitable for being loaded under tension, such as braided cable, suture, wire, or braided high-strength fibers (e.g. UHMWPE fibers). Alternatively, each pair of rigid segments 81 could be connected by at least one separate spanning member 85 securely attached to each segment 81.

The spacer 10, the spacer 70 shown in FIG. 17, or any alternatively constructed spacer of the type described herein, or portions thereof, can further be constructed from allograft bone. The spacer 70 includes a spacer body 25 that can be machined into a desired shape. The hinge sections 12 can be demineralized (for instance by exposing the hinge sections to an acid, such as HCL, so as to remove the minerals from the hinge section 12) so as to provide flexibility at the hinge sections 12. The hinge sections 12 can be partially or fully demineralized as desired. For example, segments of the allograft bone at the hinge sections 12 could be selectively demineralized, and the hinge sections 12 could be spaced along the central axis 73 of the spacer 70. Processes to demineralize hinge sections 12 of the allograft bone may include surface masking, necking, and drilling holes in the region to be demineralized. Alternatively, as described above, an allograft spacer 80 could be comprised of a multitude of rigid segments 81, and the segments 81 could be connected by at least one spanning member 85 made of allograft tendon. Suitable allograft tendons could include, but are not limited to, Achilles tendon allografts, bone-patellar tendon-bone allografts, and fascia lata allografts.

A kit for positioning a flexible implant between adjacent vertebrae V can also be provided. In one embodiment the kit comprises the guide rail instrument 50 described above as well as a plurality of flexible interbody spacers 10 and/or spacers 70. The plurality of spacers 10 and 70 can be of various sizes and shapes. The spacers 10 and 70 can have different heights H and lengths L as well as varying arrangements of hinge sections 12 to accommodate a wide range of patients and conditions as may be needed by a surgeon. The plurality of spacers 10 can contain both temporary trial spacers and permanent spacers 10. Alternatively the kit may include a plurality of guide rail instruments 50 of various sizes, shapes, and slopes. These various guide rail instruments 50 would allow a surgeon to select the optimal approach for any given surgery. Alternatively still the kit can include a plurality of interbody spacers 10 and/or 70 as described above without a guide rail instrument.

Also provided is a method for positioning a flexible interbody spacer 10 into a desired intervertebral disc space DS between adjacent vertebrae V using a non-linear approach. Once a surgeon has gained access to the target disc space DS, the area is prepared for insertion of a flexible interbody spacer 10. This preparation can include removing the original disc material. After the disc space DS has been prepared a guide rail instrument 50 can be placed into position. Preferably the distal end 51 of the guide rail instrument 50 is engaged with an adjacent vertebrae V. This engagement preferably is per-

formed by an engagement mechanism 52 such as a threaded screw 66 located on the distal end 51 of the guide rail instrument 50. The engagement mechanism 52 can be easily manipulated by a drive mechanism 54 located at the proximal end 53 of the guide rail instrument 50 which is operatively connected to the engagement mechanism 52. Once the guide rail instrument 50 is properly positioned, a flexible trial spacer 10 is slidably engaged with a guide rail track 55 at the proximal end 53 of the guide rail instrument 50. The flexible trial spacer 10 is then moved along a non-linear path into the desired disc space DS. Hinge sections 12 of the flexible trial spacer 10 allow the spacer 10 to flex as it travels along the non-linear insertion path N_{IP} . Once the trial spacer 10 is inserted it is checked to determine if it is the proper size. If a different size spacer 10 is needed the flexible trial spacer 10 may be removed and replaced with a different trial spacer 10 until the proper size is found. Alternatively, the proper size flexible interbody spacer 10 may be determined prior to surgery and thus no flexible trial spacer 10 may be needed. A flexible interbody spacer 10 is engaged with the guide rail track 55 at the proximal end 53 and slid along the guide rail instrument 50 along a non-linear insertion path N_{IP} to the desired disc space DS. Hinge sections 12 of the flexible trial spacer 10 allow the spacer 10 to flex as it travels along the non-linear insertion path N_{IP} . Flexible spacer 10 is then pushed into the disc space DS until it occupies the space that was originally occupied by patient's disc material. In one embodiment the insertion of flexible spacer 10 into the disc space DS may be facilitated by a sloped nose 24 on the front end 14 of the flexible spacer 10. After the flexible spacer 10 has been placed into its proper position with the disc space DS, the guide rail instrument 50 is disengaged from the adjacent vertebrae V by using the drive mechanism 54 as described above in reference to attaching engagement member 64 but manipulating the drive mechanism in the opposite direction. Guide rail instrument 50 is then removed from the area.

It will be appreciated by those skilled in the art that changes could be made to the embodiments described above without departing from the broad inventive concept thereof. For example, it will be understood that while embodiments have been described in the context of replacing an intervertebral disc this application may have uses involving other interbody spaces. It is understood, therefore, that this invention is not limited to the particular embodiments disclosed, but is intended to cover modifications within the spirit and scope of the present invention as defined by the above description.

What is claimed:

1. A method for positioning a flexible interbody spacer into a intervertebral disc space between adjacent vertebrae using a non-linear approach, the method comprising the steps of:

positioning a guide rail instrument that defines a track such that both: 1) a distal end of a guide rail body of the guide rail instrument faces a vertebra adjacent to the intervertebral disc space, and 2) an end of the track faces the intervertebral disc space;

engaging an engagement member of the guide rail instrument with an exterior surface of the vertebra adjacent to the intervertebral disc space, such that the engagement member both: 1) is secured relative to the vertebra adjacent to the intervertebral disc space, and 2) extends beyond both the distal end of the guide rail body and the end of the track with respect to a direction;

slidably engaging a flexible interbody spacer with the guide rail instrument;